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THREE NEW ANTS FROM MEXICO AND CENTRAL AMERICA.¹

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Pheidole tisiphone sp. nov.

Soldier. Length 5.6 mm.

Head large; from above subrectangular, longer than broad, a little broader in front than behind, with nearly straight sides and very feebly excised posterior broader and a short, shallow occipital groove; in profile truncated anteriorly, flattened above in front and feebly convex below, with a narrow and very deep scrobe on each side, running obliquely backward and downward just over the eye to the outer border of the gula and ending abruptly at the middle of the head. The edges of the scrobes are sharp and parallel, the upper edges passing anteriorly into the frontal carinae which are very widely separated. Frontal area small, deeply impressed, rounded behind. Frontal groove obsolete. Eyes small about 1-6 the distance from the anterior to the posterior border of the head. Clypeus short and very convex, with a faint, median, longitudinal impression, and entire and deflected

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anterior border. Mandibles very convex, with two large, incurved apical teeth. Antennæ very short and slender, the scapes curved, but scarcely flattened, less than half as long as the scrobe; funicles longer than the scapes; all their joints longer than broad. Thorax robust, especially in front, without humeral callosities; pro- and mesonotum in profile forming a simple subangular convexity, without a constriction at the pro-mesonotal suture; mesoëpinal constriction well-developed; epinotum small, its base and declivity sloping, not separated by an angle; spines short, slender and rather blunt, longer than broad at their bases, directed upward and slightly backward, less than half as long as the distance between their bases. Petiole from above about $1\frac{1}{2}$ times as long as broad, broadest behind, with concave sides, its node rather high, strongly compressed anteroposteriorly, in profile with concave anterior and posterior declivities and seen from behind with straight entire upper border. Postpetiole $1\frac{1}{2}$ times as broad as the petiole, convex above, nearly twice as broad as long, with the sides projecting as blunt angles, which are rounded in front and slightly concave behind. Gaster smaller than the head, elliptical. Legs long and stout, with distinctly incrassated femora.

Whole surface, especially that of the gaster, shining. Mandibles coarsely striatopunctate. Clypeus transversely rugulose-punctate. Head in front longitudinally punctate, transversely and arcuately rugulose on the posterior two thirds except the posterior corners which are rather densely reticulate-rugose. Gular surface more shining, punctate. Thorax above, including the epinotal declivity, transversely rugose, pleuræ shining, more indistinctly rugose. Petiole and postpetiole rather smooth, the latter coarsely punctate on the sides. Gaster and legs glabrous, with small, indistinct, scattered piligerous punctures.

Body, legs and scapes covered with very long, suberect, golden yellow hairs, which are very abundant on the upper surface of the head and clypeus and sparser elsewhere. The hairs on the upper surface of the head are directed backward, those on the clypeus, mandibles and gula forward.

Ferruginous red; legs slightly paler and more yellowish; gaster, borders of mandibles, clypeus, gula and antennal scrobes, black.

Described from a single worker taken by Mr. Frederick Knab at Almoloya, Oaxaca, Mexico (Nat. Mus. Coll. Type No.). Two workers taken by the same collector in the same locality may belong to this species but they are so unlike the soldier that I deem it best not to describe them.

This extraordinary species is very distinct from all the species of the genus known to me. In the possession of deep antennal scrobes running obliquely downward to the sides of the head, it resembles *Ph. aberrans* Mayr of South America and *Ph. scrobifera* Emery of Costa Rica; but the head in these species is much shorter and of a very different shape, the scrobes are shallower and broader, the pilosity and color are very different, and the latter species measures only 2.75 mm. *Ph. cavifrons* Emery of Uruguay seems

to be an allied form but although the head resembles that of *Ph. tisiphone* in outline, the sculpture is very different and the length of the body is only 3 mm.

***Macromischa lævissima* sp. nov.**

Worker. Length 1.6 mm.

Head, excluding the mandibles, nearly as broad as long, with feebly convex sides, rounded posterior corners and convex posterior border. Mandibles convex, with two large apical and 3 or 4 minute, indistinct basal teeth. Eyes rather large, convex, situated a little in front of the middle of the head. Clypeus, convex, with rounded, entire anterior border and a median longitudinal impression bounded on each side by a narrow, rather distinct ridge. Frontal area obsolete. Frontal carinae short, feeble and parallel. Antennae rather slender; scapes reaching to the posterior border of the head; funicle with a 3-jointed club as long as the remainder of the funicle; its first joint fully as long as joints 2-4 together; joints 2 and 8 as long as broad, joints 3-7 a little broader than long, joints 9 and 10 together shorter than the terminal joint. Thorax narrower and a little longer than the head with the mandibles, from above somewhat broader in front than behind, with rounded humeri, in profile evenly rounded dorsally, without sutures or constrictions; epinotum depressed and sloping, without distinct base and declivity, armed with two rather long, slender, acute spines, which are directed backward and outward and slightly upward, closely approximated at their bases and with their tips very slightly deflected. Petiole with a long, slender peduncle and an erect node at its posterior end. This node is nearly as high as the length of the peduncle, strongly compressed anteroposteriorly with rounded upper border and flat anterior and posterior surfaces, the former passing over rather abruptly into the horizontal dorsal surface of the peduncle. Postpetiole from above a little broader than the petiole, broader than long, subrectangular, nearly as broad in front as behind; in profile its node is convex though much lower than the node of the petiole. Gaster elliptical, with broadly excised anterior margin and feebly convex sides and dorsal surface. Legs rather long; middle and hind femora incrassated.

Surface very smooth and shining; mandibles, sides of clypeus and cheeks finely and sharply striated; surface of head, thorax and gaster with much scattered, minute piligerous punctures.

Hairs white, very short, erect and scattered, obtuse on the body, slender, pointed and appressed on the legs and antennal scapes.

Black, mandibles, antennae, petiole and postpetiole dark brown; tibiae and tarsi brownish yellow.

Described from a single specimen taken by Prof. A. Petrunkevitch at La Buena Ventura, near Santa Rosa, Vera Cruz, Mexico.

M. lævissima is the smallest known species of the genus. It is closely related to the Texan *M. subditiva* Wheeler and goes down to it in my table of *Macromischa* (Bull. Amer. Mus. Nat. Hist.

XXIV, 1908, p. 141). This latter species, however, is larger, its head and thorax are not glabrous but rugulose, its epinotal spines are somewhat shorter and stouter, and the erect, obtuse hairs on the body are much longer and more abundant.

***Apterostigma calverti* sp. nov.**

Worker. Length 3.5–4 mm.

Head, excluding the mandibles about $1\frac{1}{2}$ times as long as broad, with rather straight, parallel sides and broadly rounded, convex posterior portion, suddenly contracted into a short neck without a reflected posterior edge. Vertex with a feeble longitudinal impression in the middle. Eyes convex, at the middle of the sides of the head. Clypeus about twice as long as broad, with broadly rounded entire anterior border. Mandibles with 7–9 teeth, the two apical ones largest. Frontal carinae in front with large, thick lobes, behind continued as diverging ridges which are shorter than the lobes. Antennae robust; scapes surpassing the posterior border of the head by about $\frac{1}{4}$ their length, first funicular joint as long as joints 2–4 together; joints 2–9 not longer than broad. Thorax rather stout; pronotum with prominent, reflexed cervical border, behind with a transverse convexity which is continued down onto the mesopleura as a distinct, rounded ridge; mesonotum with a pair of very distinct, subparallel, longitudinal ridges, more approximated in the middle; base of epinotum with a similar pair of ridges which are shorter, more closely approximated and more nearly parallel. In profile the base of the epinotum is moderately convex and longer than the concave declivity with which it forms a rounded angle. Constriction between meso- and epinotum much the same as in other species, but with a short ridge on each side. Epinotal stigmata very prominent. Petiole from above about twice as long as broad, broadest behind and growing gradually narrower anteriorly as far as the stigmata where it narrows more suddenly to the insertion in the epinotum. In profile the node is low and rounded, about half as high as the length of the petiole, with long, straight anterior and more abrupt, slightly concave, posterior slope. Postpetiole as long as broad, campanulate, broadest behind, with rounded sides, very feebly excised posterior border and a very feeble dorsal impression behind. Gaster elliptical, without a longitudinal ridge on each side of the first segment. Legs long and rather stout.

Mandibles glossy, with smooth and shining dentate border, the remaining surface finely striated and finely and sparsely punctate. Antennal funiculi slightly shining; body scapes and legs very opaque and very finely and densely punctate; the head, thorax, petiole, postpetiole and gaster being also rather coarsely reticulate-rugose.

Hairs much as in other species; black at the base with grayish or yellow tips, coarser and more appressed than in *wasmani*, scarcely curved at the base on the tibiae and scapes. Pubescence fulvous, sparse and very short.

Black or dark brown; mandibles, funiculi, tarsi and articulations of the legs, petiole and gaster ferruginous; mandibular teeth black; impressions between the ridges on the thorax not paler than the surrounding surfaces.

Female. Length 4.5, mm.

Closely resembling the worker, but with the neck like posterior portion of the head much longer and the eyes larger. Mesonotum above with four longitudinal welts, the two lateral of which are short and feeble and cover the paraptera, while the two median are longer. Scutellum behind bearing two flat, blunt teeth which are as long as broad at their bases. Epinotum in profile with subequal base and declivity, both flattened and meeting to form an obtuse angle. Seen from above the base bears a pair of longitudinal ridges like those of the worker.

Sculpture, pilosity and color as in the worker. The hairs are, perhaps, shorter and more appressed on the head and thorax. Wings opaque, gray, with yellow stigmal region and two sharply defined, elongate black spots, one at the base and the other between the two branches of the cubital vein.

Described from twelve workers, one dealated and five winged females taken by Dr. P. P. Calvert from two colonies in the Banana River District and Juan Viñas, Costa Rica, during October and November, 1909. Both the colonies from which the specimens were taken had constructed their fungus-gardens between the overlapping leaves of Bromeliads growing on trees 10–15 feet above the ground. One of the Bromeliads was also tenanted by a caterpillar and the larva of an interesting dragon-fly (*Mecistogaster modestus*). Fragments of one of the fungus-gardens, preserved in alcohol with the ants, seemed to present the same primitive development of the hyphal swellings ("ambrosia") growing on a substratum of insect (beetle?) excrement as described by Moeller for some of the South American species of *Apterostigma*. The gardens of all previously described species of this genus have been found either in rotting wood or under stones. The unusual situation of the gardens of the new species may account for its having been overlooked by the many diligent collectors of Central American Formicidæ.

A. calverti is most closely related to *A. wasmanni* Forel, but differs in its much darker color, coarser sculpture and pilosity, in the shorter backward continuations of the frontal carinæ, and in lacking the longitudinal lateral ridges on the first gastric segment. The following table will serve for the identification of the workers of the known species of the genus, with the exception of the Mexican *A. scutellare*, which is known only from a single male specimen:

1. Head gradually constricted behind into a narrow neck, which has a distinctly reflected or expanded posterior edge. 2

- Head suddenly constricted behind, without a neck or with a short neck, the posterior edge of which is not reflected or expanded. 4
2. Petiole scarcely more than twice as long as broad; joints 2-9 of the funiculus not or very slightly longer than broad. 3
 Petiole three times as long as broad; all the funicular joints distinctly longer than broad. Length 6-6.5 mm. Trinidad. **urichi** Forel.
3. Neck rather short and but slightly reflected at its posterior edge; funicular joints 2-7 not longer than broad. Length 3.5-4 mm. Brazil. **pilosum** Mayr.
 Neck longer and more distinctly reflected at its posterior edge; funicular joints 2-7 longer than broad; antennæ and petiole more slender; hairs on body and legs longer and less appressed. Length 4.6 mm. Costa Rica. **collare** Emery
4. Head without a neck. Length 3.5 mm. Buenos Aires. **steigeri** Santsche.
 Head with a short but distinct neck. 5
5. Postpetiole longer than broad; body slightly shining, dirty brown, with ochre yellow antennæ, mandibles and legs. Length 3.2-3.5 mm. Brazil. **mœlleri** Forel.
 Postpetiole broader than long, body opaque. 6
6. Ridges on meso- and epinotum feebly developed. 7
 Ridges on meso- and epinotum strongly developed. 8
7. Funicular joints 3-7 a little longer than broad. Length 6 mm. Costa Rica. **robustum** Emery.
 Funicular joints 3-7 broader than long. Length 3.4-3.5 mm. Trinidad. **mayri** Forel.
8. Ferruginous; body indistinctly reticulate-rugose; first gastric segment with well developed lateral ridges; posterior diverging portions of frontal carinæ longer than the lobes; hairs on antennal scapes and tibiæ curved at the base. Length 3.5-4 mm. Brazil. **wasmanni** Forel.
 Black or dark brown; body more distinctly reticulate-rugose; first gastric segment without lateral ridges; posterior diverging portions of frontal carinæ shorter than the lobes; hairs on antennal scapes and tibiæ not curved at the base. Length 3.5-4 mm. Costa Rica. **calverti** sp. nov.